Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application.

1. (Currently Amended) A method for improving channel efficiency in a communication system that complies with a Data Over Cable Service Interface Specification (DOCSIS) standard, comprising:

establishing one or more proprietary logical channels for communication between a first device that supports at least one proprietary communication parameter and other devices that support said at least one proprietary communication parameter;

receiving registration information from a second device, wherein said registration information indicates that said second device supports said at least one proprietary communication parameter;

determining whether said second device may be assigned to one of said one or more proprietary logical channels based on said registration information;

assigning said second device to said one of said one or more proprietary logical channels when said second device may be assigned to said one of said one or more proprietary logical channels; [[and]]

determining whether a predetermined number of currently registered devices support said at least one proprietary communication parameter when said second device cannot be assigned to said one of said one or more proprietary logical channels; and

creating a new proprietary logical channel when [[a]] said predetermined number of currently registered devices support said at least one proprietary communication parameter and assigning said second device to said new proprietary logical channel when

said second device cannot be assigned to said one of said one or more proprietary logical channels.

2. (Original) The method of claim 1, wherein said first device comprises a cable modem termination system (CMTS) and said second device comprises a cable modem.

3. - 5. (Cancelled)

6. (Previously Presented) The method of claim 1, wherein said establishing said one or more proprietary logical channels comprises:

generating an Upstream Channel Descriptor (UCD) message, wherein said UCD message includes said at least one proprietary communication parameter.

7. (Previously Presented) The method of claim 6, wherein said generating said UCD message comprises:

generating a UCD message having a version field or a type field that comprises a value not provided for by said DOCSIS standard.

8. (Previously Presented) The method of claim 6, wherein said establishing said one or more proprietary logical channels further comprises:

sending said UCD message only to devices that support said at least one proprietary communication parameter.

9. (Original) The method of claim 8, wherein said sending said UCD message only to devices that support said at least one proprietary communication parameter comprises:

accessing a database of identifiers of devices that support said at least one proprietary communication parameter; and

generating a unicast UCD message addressed to each of said devices having an identifier in said database.

10. (Previously Presented) The method of claim 8, wherein said sending said UCD message only to said devices that support said at least one proprietary communication parameter comprises:

accessing an identifier that identifies a plurality of devices that support said at least one proprietary communication parameter; and

generating a multicast UCD message addressed to said plurality devices identified by said identifier.

11. (Previously Presented) The method of claim 1, wherein said receiving said registration information from said second device comprises:

sending a first unicast message to said second device to determine if said second device implements any proprietary features;

receiving a message from said second device, wherein said message indicates support by said second device for said at least one proprietary communication parameter; and

sending a second unicast message to said second device, wherein said second unicast message indicates support by said first device for said at least one proprietary communication parameter.

12. (Previously Presented) The method of claim 1, wherein said assigning said second device to said logical channel comprises:

generating a unicast message to said second device identifying said logical channel.

13. (Currently Amended) A cable modem termination system (CMTS) for improving channel efficiency in a cable modem system that complies with a Data Over Cable Service Interface Specification (DOCSIS) standard, comprising:

an upstream channel manager configured to establish one or more proprietary logical channels for communication with cable modems that support at least one proprietary communication parameter;

a registration module configured to:

(i) receive registration information from a cable modem, wherein said registration information indicates that said cable modem supports said at least one proprietary communication parameter,

(ii) determine whether one of said one or more proprietary logical channels may be assigned to said cable modem,

(iii) assign said cable modem to said one or more proprietary logical channels when said cable modem may be assigned to said one of said one or more proprietary logical channels, [[and]]

(iv) determine whether a predetermined number of currently registered devices support said at least one proprietary communication parameter when said second device cannot be assigned to said one of said one or more proprietary logical channels, and

~~(iv)~~ (v) create a new proprietary logical channel when [[a]] said predetermined number of currently registered cable modems support said at least one proprietary communication parameter and to assign said cable modem to the new proprietary logical channel when said cable modem cannot be assigned to one of said one or more proprietary logical channels.

14. - 16. (Cancelled)

17. (Previously Presented) The CMTS of claim 13, wherein said upstream channel manager is further configured to determine whether or not to establish said one or more proprietary logical channels.

18. (Previously Presented) The CMTS of claim 13, wherein said upstream channel manager is further configured to generate a UCD message that includes said at least one proprietary communication parameter.

19. (Previously Presented) The CMTS of claim 18, wherein said upstream channel manager is further configured to generate a UCD message having a version field or a type field that comprises a value not provided for by said DOCSIS standard.

20. (Previously Presented) The CMTS of claim 18, wherein said upstream channel manager is further configured to send said UCD message only to cable modems that support said at least one proprietary communication parameter.

21. (Previously Presented) The CMTS of claim 20, wherein said upstream channel manager is further configured to access a database of identifiers of cable modems that support said at least one proprietary communication parameter, and to generate a unicast UCD message addressed to each of said cable modems having an identifier in said database.

22. (Previously Presented) The CMTS of claim 20, wherein said upstream channel manager is further configured to access an identifier that identifies a plurality of cable modems that support said at least one proprietary communication parameter, and to generate a multicast UCD message addressed to said plurality devices identified by said identifier.

23. (Previously Presented) The CMTS of claim 13, wherein said registration module is further configured to send a first unicast message to said cable modem to determine if said cable modem implements any proprietary features, to receive a message from said

cable modem, wherein said message indicates that said cable modem supports said at least one proprietary communication parameter, and to send a second unicast message to said cable modem, wherein said second unicast message indicates that said CMTS supports said at least one proprietary communication parameter.

24. (Previously Presented) The CMTS of claim 13, wherein said registration module is further configured to generate a unicast message to said cable modem identifying said logical channel.

25. (Currently Amended) A non-transitory computer useable medium having stored thereon, computer executable instructions that, if executed by a processor, cause the processor to ~~perform a method~~ improve channel efficiency in a cable modem system that complies with a Data Over Cable Service Interface Specification (DOCSIS) standard, the instructions comprising:

instructions for establishing one or more proprietary logical channels for communication between a first device that implements at least one proprietary communication parameter associated with bandwidth utilization and other devices that support said at least one proprietary communication parameter;

instructions for receiving registration information from a second device, wherein said registration information indicates that said second device supports said at least one proprietary communication parameter;

instructions for determining whether said second device may be assigned to one of said one or more proprietary logical channels based on said registration information;

instructions for assigning said second device to said one of said one or more proprietary logical channels when said second device may be assigned to said one of said one or more proprietary logical channels; [[and]]

instructions for determining whether a predetermined number of currently registered devices support said at least one proprietary communication parameter when said second device cannot be assigned to said one of said one or more proprietary logical channels; and

instructions for creating a new proprietary logical channel when [[a, said predetermined number of currently registered devices support said at least one proprietary communication parameter and assigning said second device to said new proprietary logical channel when said second device cannot be assigned to said one of said one or more proprietary logical channels.

26. (Currently Amended) The non-transitory computer ~~program product~~ useable medium of claim 25, wherein said first device comprises a cable modem termination system (CMTS) and said second device comprises a cable modem.

27. - 29. (Cancelled)

30. (Currently Amended) The non-transitory computer ~~program product~~ useable medium of claim 25, wherein said ~~step of said~~ instructions for establishing one or more proprietary logical channels comprises:

instructions for generating an Upstream Channel Descriptor (UCD) message, wherein said UCD message includes said at least one proprietary communication parameter.

31. (Currently Amended) The non-transitory computer ~~program product~~ useable medium of claim 30, wherein said ~~step of~~ instructions for generating said UCD message comprises:

instructions for generating a UCD message having a version field or a type field that comprises a value not provided for by said DOCSIS standard.

32. (Currently Amended) The non-transitory computer ~~program product~~ useable medium of claim 30, wherein said ~~step of~~ instructions for establishing said one or more proprietary logical channels further comprises:

instructions for sending said UCD message only to devices that support said at least one proprietary communication parameter.

33. (Currently Amended) The non-transitory computer ~~program product~~ useable medium of claim 32, wherein said ~~step of~~ instructions for sending said UCD message only to said devices that support said at least one proprietary communication protocol comprises:

instructions for accessing a database of identifiers of devices that support said at least one proprietary communication protocol; and

instructions for generating a unicast UCD message addressed to each of said devices having an identifier in said database.

34. (Currently Amended) The non-transitory computer ~~program product~~ useable medium of claim 32, wherein said ~~step of~~ instructions for sending said UCD message only to said devices that support said at least one proprietary communication parameter comprises:

instructions for accessing an identifier that identifies a plurality of devices that support said at least one proprietary communication parameter; and

instructions for generating a multicast UCD message addressed to said plurality devices identified by said identifier.

35. (Currently Amended) The non-transitory computer ~~program product~~ useable medium of claim 25, wherein said ~~step of~~ instructions for receiving said registration information from said second device comprises:

instructions for sending a first unicast message to said second device to determine if said second device implements any proprietary features;

instructions for receiving a message from said second device, wherein said message indicates support by said second device for said at least one proprietary communication parameter; and

instructions for sending a second unicast message to said second device, wherein said second unicast message indicates support by said first device for said at least one proprietary communication parameter.

36. (Currently Amended) The non-transitory computer ~~program product~~ useable medium of claim 25, wherein said ~~step of~~ instructions for assigning said second device to said logical channel comprises:

instructions for generating a unicast message to said second device identifying said logical channel.

37. (Previously Presented) The method of claim 1, wherein said at least one proprietary communication parameter includes at least one of a group consisting of a modulation rate, base rate, and an alpha value.

38. (Previously Presented) The CMTS of claim 13, wherein said at least one proprietary communication parameter includes at least one of a group consisting of a modulation rate, base rate, and an alpha value.

39. (Currently Amended) The non-transitory computer ~~program product~~ useable medium of claim 25, wherein said at least one proprietary communication parameter includes at least one of a group consisting of a modulation rate, base rate, and an alpha value.

40. (Previously Presented) The method of claim 1, wherein said at least one proprietary communication parameter is not provided for by said DOCSIS standard.

41. (Previously Presented) The CMTS of claim 13, wherein said at least one proprietary communication parameter is not provided for by said DOCSIS standard.

42. (Currently Amended) The non-transitory computer ~~program product~~ useable medium of claim 25, wherein said at least one proprietary communication parameter is not provided for by said DOCSIS standard.

43. (Previously Presented) The method of claim 1, further comprising:

assigning said second device to a standard DOCSIS channel when said predetermined number of currently registered devices does not support said at least one proprietary communication parameter.

44. (Previously Presented) The CMTS of claim 13, wherein said registration module is further configured to assign said cable modem to a standard DOCSIS channel when said predetermined number of currently registered cable modems does not support said at least one proprietary communication parameter.

45. (Currently Amended) The non-transitory computer ~~program product~~ useable medium of claim 25, further comprising:

instructions for assigning said second device to a standard DOCSIS channel when said predetermined number of currently registered devices does not support said at least one proprietary communication parameter.